# CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO
# COYOTECAREERS
## *Cumulative Final Report*

## FEBRUARY 18, 2013

Submitted by: Rebecca M. Eddy, Ph.D.
Monique H. Matelski, M.A.

# COBBLESTONE
## APPLIED RESEARCH & EVALUATION, INC.

# Table of Contents

## Tables

## Figures

# Executive Summary

Cobblestone Applied Research and Evaluation, Inc. (herein referred to as Cobblestone) was hired by CSUSB to examine the overall impact of the Title V-funded *CoyoteCareers* program. This report provides a comprehensive summary of the project's evaluation through the entirety of the grant, from October 1, 2007 through September 30, 2012. Cobblestone was hired to answer three main questions. The following table illustrates the evaluation questions and the data sources and analyses used to answer these questions.

| Evaluation Question | Data Sources and Analyses |
|---|---|
| **Academic and Student Support Services** | |
| **Q1)** Do the activities in the *CoyoteCareers* program expand and enhance academic support offerings, career preparation, program quality, internship availability in SMART fields, and involvement of alumni at CSUSB? | • Cumulative Summaries of *CoyoteCareers* Goals<br>• Philanthropic Allocation Report<br>• Cumulative Summaries of<br>  – Tutor Satisfaction<br>  – Mean ACE Module Satisfaction<br>  – Service Learning Site Supervisor Satisfaction<br>  – Service Learning Intern Satisfaction<br>• Cumulative Summary of *CoyoteCareers* presentations, recognition, and awards |
| **Student Academic Achievement** | |
| **Q2)** Do the activities in the *CoyoteCareers* program expand educational opportunities for and improve the academic achievement of Hispanic and low-income students in the SMART fields? | • Archival Data Analysis (tutoring only)<br>  – GPA<br>  – Dosage<br>• In-Depth Tutoring Analysis<br>  – STEM Student Survey<br>  – Tutor Interviews |
| **Student Retention and Graduation** | |
| **Q3)** Do the activities in the *CoyoteCareers* program help Hispanic and low-income students complete postsecondary degrees in the SMART disciplines? | • Archival Data Analysis<br>  – Retention, Graduation<br>• *CoyoteCareers* service learning graduates "where are they now?" summary |

## Academic and Student Support Services

Overall, program activities and services have expanded and enhanced academic support offerings, career preparation, program quality, internship availability in the Sciences, Mathematics, and Access to Retain Talent (SMART) fields (see **Appendix A** for a full list of SMART majors), and involvement of alumni at CSUSB. *CoyoteCareers* has either met or surpassed all of its program goals indicating that program activities have expanded academic and career support services for program-eligible students and the CSUSB community at large. *CoyoteCareers* activities have also enhanced students' career and educational experiences and opportunities as indicated by students' high level of satisfaction with program components.

## Student Academic Achievement

*CoyoteCareers* has improved the academic achievement of program-eligible students in the SMART fields. Tutoring was the main program component thought to positively impact students' academic performance. It was found that tutoring improved the academic achievement (i.e., grade performance) of program-eligible students. That is, program-eligible students who attended tutoring received higher course grades in the classes in which they received tutoring than program-eligible students who did not

attend tutoring. Tutoring dosage (i.e., the amount of tutoring received) was not related to grade performance given that more tutoring does not necessarily predict higher grades. Tutor interview data suggests that the reason for this finding is that students who usually use tutoring the most are those who are at high risk of failing their class.

### Student Retention and Graduation

Findings suggest that *CoyoteCareers* program activities help program-eligible students' complete postsecondary degrees. Analyses indicate that program-eligible students (and CSUSB students in general) who took advantage of program activities were more likely to stay retained and graduate than students who did not participate in program activities. Additionally, tutoring and ACE participation significantly predicted academic persistence. Although internship participation did not predict academic persistence, survey data indicate that many former service learning interns attended graduate and/or professional school and were offered employment at jobs in their field of study.

### Conclusions

Originally designed to support low-income and Hispanic students in SMART disciplines at CSUSB, *CoyoteCareers* has grown to have a positive impact on many student organizations, departments, alumni, and community organizations in addition to students directly served by the program. Without question, the *CoyoteCareers* program has a) enhanced and expanded academic and support services for all students, b) improved the academic achievement (i.e., grade performance) of program-eligible students who took advantage of tutoring services, and c) increased retention and graduation rates for program-eligible students as well as CSUSB participating students in general. *CoyoteCareers* should continue to serve as a model program for other CSU campuses as well as other Hispanic-Serving Institutions throughout the United States.

CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO

Although the Hispanic population in the United States continues to rapidly grow, Hispanic students are under-represented in the nation's higher education Science, Technology, Engineering, and Mathematics (STEM) pipe-line (Chapa & De La Rosa, 2006). The college age popula-tion of the United States is increasingly made up of members of minority groups, such as Hispanics and African Americans, whose current participation rates in STEM are half or less than white non-Hispanic students (National Science Foundation, 2005). Not only do fewer minority students choose to purse STEM degrees, unfor-tunately significant disparities remain such that retention and graduation of these students in STEM disciplines are at unsatisfactory levels (Fischer, 2010).

Even if these students are able to persist and graduate with a degree in STEM, they often find themselves unpre-pared for the work world after graduation because they lack a) practical job experience (Kezar & Rhoads, 2001; Pascarella, Pierson, Wolniak, & Terenzini, 2004), b) professional role models and networks (Borders-Edgar, Arrendondo, Kurpius, & Rund, 2011), and c) essential "soft skills" necessary for competing in the job market.

In an effort to offset these negative trends among low-income and Hispanic students at California State Univer-sity, San Bernardino (CSUSB), *CoyoteCareers*, a Title V-funded initiative, sought to support Hispanic/Latino and low-income students in the Science and Mathematics Access to Retain Talent (SMART) fields at CSUSB. *CoyoteCareers* aimed to accomplish three main goals:

- **Goal I:** Expand limited institutional resource to help Hispanic, low-income students complete SMART field curricula

- **Goal II**: Pilot/implement an experiential Academic Career Education (ACE) support program that is effective for Hispanic and low-income students in SMART fields and strategic foreign languages

- **Goal III:** Enhance student retention and career readiness by expanding alumni and community partnerships

Specifically, *CoyoteCareers* aimed to attain these goals and ameliorate the aforementioned problems by provid-ing the targeted population with tutoring services, "soft" skill workshops, service learning internships, and oppor-tunities to build professional networks with alumni.

Cobblestone Applied Research and Evaluation, Inc. (herein referred to as Cobblestone) was hired by CSUSB to examine the overall impact of the *CoyoteCareers* program. Specifically, Cobblestone was hired to answer three main questions:

| Academic and Student Support Services Evaluation Question 1: | Student Academic Achievement Evaluation Question 2: | Student Retention and Graduation Evaluation Question 3: |
|---|---|---|
| Do the activities in the *CoyoteCareers* program expand and enhance academic support offerings, career preparation, program quality, internship availability in SMART fields, and involvement of alumni at CSUSB? | Do the activities in the *CoyoteCareers* program expand educational opportunities for and improve the academic achievement of Hispanic and low-income students in the SMART fields? | Do the activities in the *CoyoteCareers* program help Hispanic and low-income students complete postsecondary degrees in the SMART disciplines? |

This report provides a comprehensive summary of the project's evaluation through the entirety of the grant, from October 1, 2007 through September 30, 2012. The following table illustrates the evaluation questions and the data sources and analyses used to answer these questions.

| Evaluation Question | Data Sources and Analyses |
|---|---|
| **Academic and Student Support Services** | |
| **Q1)** Do the activities in the *CoyoteCareers* program expand and enhance academic support offerings, career preparation, program quality, internship availability in SMART fields, and involvement of alumni at CSUSB? | • Cumulative Summaries of *CoyoteCareers* Goals<br>• Philanthropic Allocation Report<br>• Cumulative Summaries of<br>   – Tutor Satisfaction<br>   – Mean ACE Module Satisfaction<br>   – Service Learning Site Supervisor Satisfaction<br>   – Service Learning Intern Satisfaction<br>• Cumulative Summary of *CoyoteCareers* presentations, recognition, and awards |
| **Student Academic Achievement** | |
| **Q2)** Do the activities in the *CoyoteCareers* program expand educational opportunities for and improve the academic achievement of Hispanic and low-income students in the SMART fields? | • Archival Data Analysis (tutoring only)<br>   – GPA<br>   – Dosage<br>• In-Depth Tutoring Analysis<br>   – STEM Student Survey<br>   – Tutor Interviews |
| **Student Retention and Graduation** | |
| **Q3)** Do the activities in the *CoyoteCareers* program help Hispanic and low-income students complete postsecondary degrees in the SMART disciplines? | • Archival Data Analysis<br>   – Retention, Graduation<br>• *CoyoteCareers* service learning graduates "where are they now?" summary |

# Academic and Student Support Services

**Q1)** Do the activities in the *CoyoteCareers* program expand and enhance academic support offerings, career preparation, program quality, internship availability in SMART fields, and involvement of alumni at CSUSB?

One of the main goals of the *CoyoteCareers* program was to expand and enhance student support services for the targeted population in hopes that this would ultimately improve academic achievement, and retention and graduation rates. To answer the first part of evaluation question number one, do program activities *expand* academic and career support services for program eligible students, the programs' progression towards reaching key program acitvity goals was tracked. Cumulative summaries of these goals are provided below (see **Figures 1-10**). The figures illustrate how *CoyoteCareers* has either met or surpassed each program goal that was established prior to the beginning of the grant.

*CoyoteCareers* aimed to increase tutoring hours provided throughout the duration of the 5-year grant period. The target was to provide 666 (74 hours x 9 weeks) hours of tutoring each quarter (excluding summer quarter) for a total of 9,990 hours of tutoring by the end of the program. The Learning Center and program staffs' tremendous efforts to promote tutoring services were successful, as **Figure 1** illustrates, *CoyoteCareers* was able to surpass this goal by by 3,974 hours.

8

Figure 1. *CoyoteCareers* Total Tutoring Hours Provided
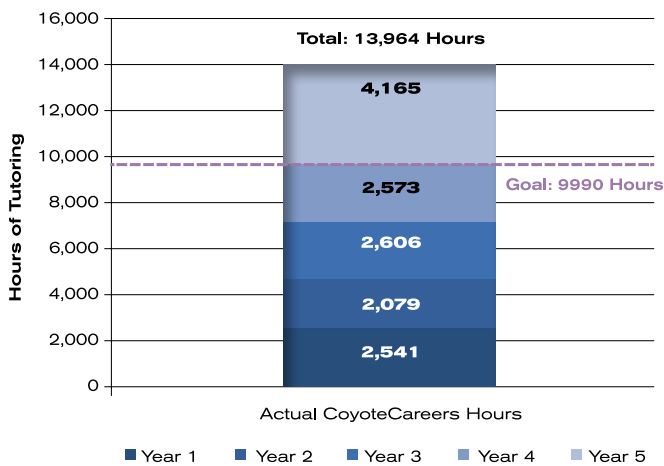


*CoyoteCareers* also aimed to pilot/implement an experiential Academic Career Education (ACE) support program for Hispanic and low-income students in the

Figure 2. *CoyoteCareers* ACE Modules Designed
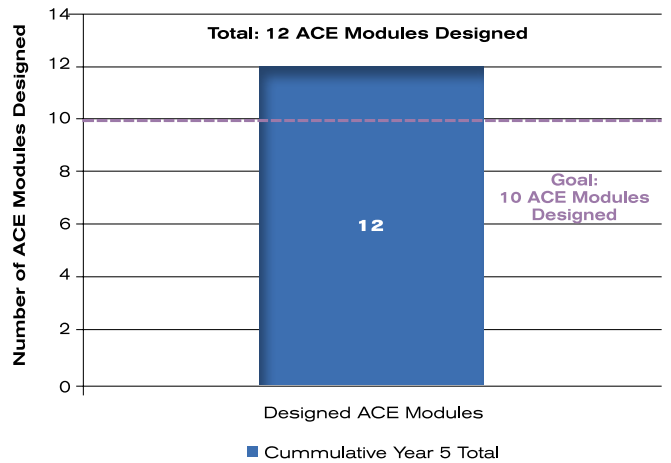


SMART fields. The ACE program was designed to help fill in the gaps in students' "soft" skills education, that is their understanding of appropriate business etiquette, how to write a resume, cover letter, interview, etc.  There were three goals associated with this program component. First, *CoyoteCareers* aimed to design 10 ACE module workshops. Second, they planned to implement the module workshops with 100 unique students (program-eligible students) per year. Third, the program planned to create 10 "Day in the Life" videos that depicted various alumni at their jobsites. *CoyoteCareers* surpassed the first two targeted goals and met the last goal. They designed 12 ACE module workshops by Year 4 of the program (see **Figure 2**), they implemented these module workshops with 854 unique

Figure 3. *CoyoteCareers* Unique Stuent ACE Participation
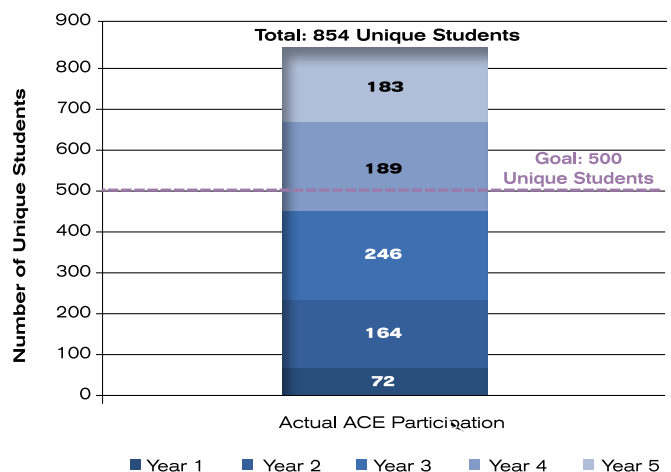
students by the end of Year 5 (see **Figure 3**), and they created 10 videos by the end of Year 5 (see **Figure 4**).

## Figure 4. *CoyoteCareers* "Day in the Life" Videos Created
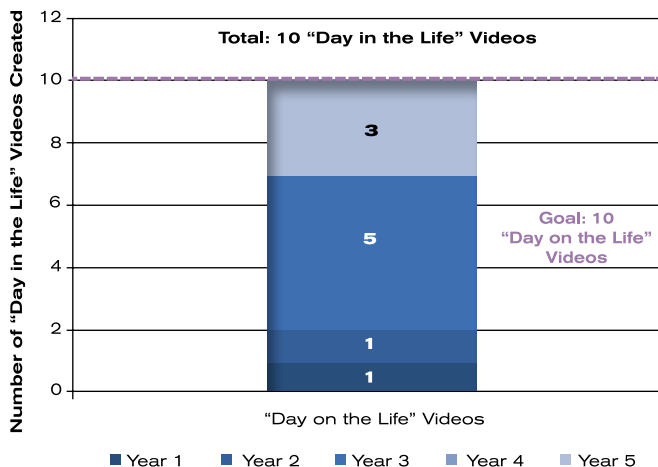


Another aim of the *CoyoteCareers* program was to expand alumni and community partnerships. The program provided students with opportunities to build professional networks with alumni and community partners and gain practical work experience through service learning internships. With regard to alumni affairs, *CoyoteCareers* aimed to increase the number of complete alumni records, prospective alumni volunteers, and actual volunteers, and establish a Hispanic alumni association. Specifically, *CoyoteCareers* aimed to increase the number of alumni with complete contact information by 75% (7,172 complete records) by the end of the program. **Figure 5** illustrates that the program surpassed this goal by 296 records. Additionally, *CoyoteCareers* aimed to identify 500 prospective volunteers and 200 actual volunteers by the end of Year 5.

## Figure 5. *CoyoteCareers* Complete Alumni Records
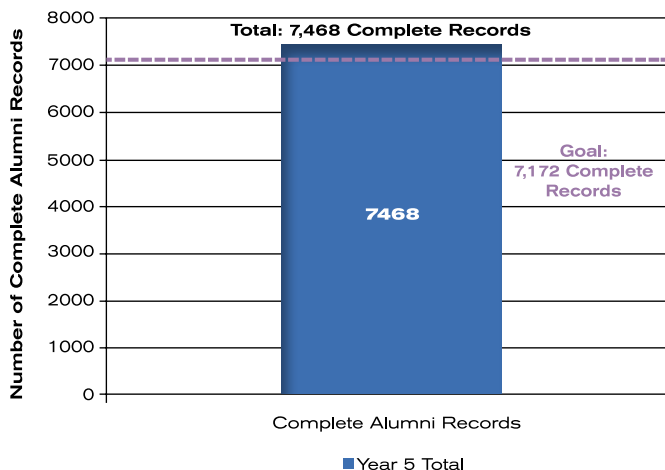


As seen in **Figure 6**, the program was able to identify more volunteers than was planned. Additionally, the goal of having 200 actual volunteers was exceeded by approximately 500 (see **Figure 7**).

## Figure 6. *CoyoteCareers* Prospective Volunteers Identified
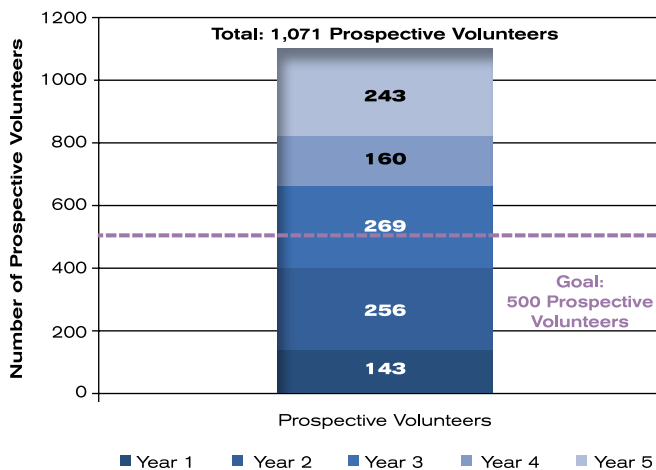


## Figure 7. *CoyoteCareers* Alumni Actual Volunteers
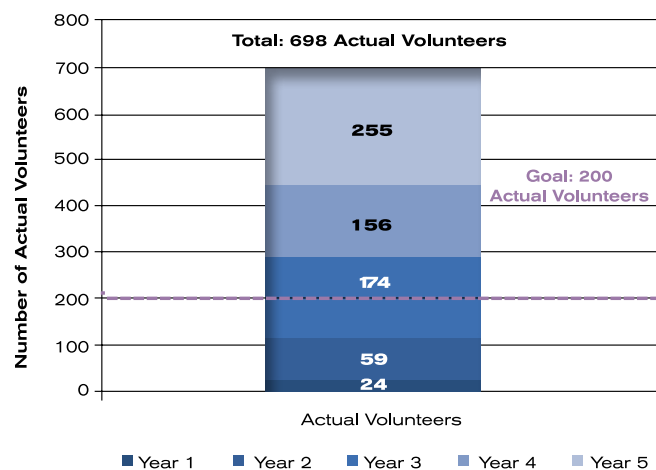


*CoyoteCareers* also aimed to establish a Hispanic Alumni Chapter and grow by 50 alumni annually. The program met and surpassed this goal, that is, they were able to establish an active alumni chapter that grew to have 488 members by the end of Year 5 (see **Figure 8**).

*CoyoteCareers* also developed the service learning portion of their program in an effort to provide students with opportunities to gain practical work experience. They spent the earlier years of the grant identifying potential service learning sites in the SMART fields. They aimed to recruit 20 new service learning sites per year and train service learning site supervisors from these sites by the

Figure 8. *CoyoteCareers* Hispanic Alumni Chapter Membership



Figure 9. *CoyoteCareers* Service-Learning Site Supervisors Trained



Figure 10. *CoyoteCareers* Service Learning Internships Completed
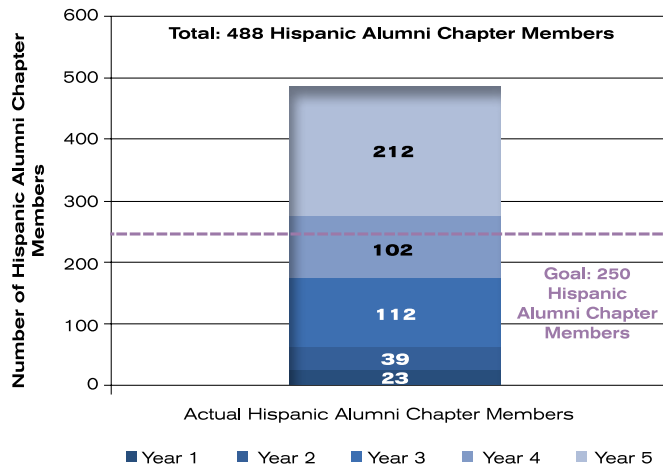


end of Year 5 (for a total of 100 sites recruited/site supervisors trained). As seen in **Figure 9**, *CoyoteCareers* surpassed this goal by recruiting 20 extra sites and training their corresponding supervisors.

Additionally, *CoyoteCareers* aimed to place 30 service learning interns each year (and 20 in Year 1) for a total of 140 service learning interns by Year 5. **Figure 10** illustrates that the program exceeded this goal by 15 interns.

With the cumulative goal summary data (**Figures 1 – 10**) we are able to answer the first part of evaluation question number one, that is, we are able to state confidently that *CoyoteCareers* expanded academic and student support services. The program has either met or surpassed all stated program activity goals. They have been able to increase support offerings at CSUSB not only for program-eligible students but also for the entire CSUSB student body.

Further analyses were conducted to assess whether alumni donations (indirectly related to alumni involvement) increased since the beginning of the program. To summarize the expansion of alumni involvement, the cumulative data suggest that program efforts helped to increase complete alumni records, build and expand the Hispanic Alumni Association, and increase the number of prospective and actual alumni volunteers. The program hoped that by increasing alumni involvement, they would be able to provide students with role models and opportunities to build professional networks. They also anticipated that by increasing alumni involvement this would lead to a corresponding increase in alumni donations providing sustainability for benefical program components. A Philanthropic Allocation Report was requested from the University Advancement Office of Development to assess whether there was an increase in alumni donations since the onset of the *CoyoteCareers* program five years ago. As seen in **Table 1**, the decrease in alumni donors and dollars donated in Years 2-4 reflected a similar downturn in the local and national economy. Also, it should be noted that reported donation numbers represent alumni donations to CSUSB in general; they are not specific to the *CoyoteCareers* program.

To answer the second part of the first evaluation question, do program activies *enhance* academic support offerings, program participants' satisfaction with program activities was assessed. Students' level of satisfaction was not assessed prior to the grant; however, measuring students' satisfaction after using services does provide an assessment of overall program quality. Cumulative summaries of program participants' satisfaction with tutors, ACE modules, and service learning experiences as well as site supervisors satisfaction with their service learning intern are provided below (see **Tables 2-4**; **Figure 11**).

Table 1. Cumulative Philanthropic Allocation Report

|  | Baseline | Year One | Year Two | Year Three | Year Four | Year Five | Cumulative |
|---|---|---|---|---|---|---|---|
| Dollars Donated | $406,839 | $435,699 | $192,422 | $170,971 | $189,666 | $282,827 | **$1,507,453** |
| Alumni Donated | 1,267 | 1,397 | 1,277 | 992 | 1,053 | 963 | **5,957** |

Program participants rated their level of satisfaction with tutors at the Learning Center each year of the program (see **Table 2**). Data suggest that overall students' were very satisifed with their tutors and their experiences in tutoring. They found tutors to be knowledgeable of subject material and able to make students' coursework understandable.

Students who attended ACE module workshops were asked to evaluate their experiences attending the workshops. **Figure 11** illustrates mean ACE module workshop satisfaction ratings for each ACE module throughout the duration of the program. Over 1,400 students rated their level of satisfaction with ACE module workshops over the 5-year program period. Overall, results indicate that students were very satisfied with their experience and that key learning objectives were attained.

Table 2. Cumulative Tutoring Satisfaction Ratings

|  | Year One (N = 146) | Year Two (N = 194) | Year Three (N = 110) | Year Four (N = 112) | Year Five (N = 94) | Cumulative |
|---|---|---|---|---|---|---|
| Quality of information provided | 4.85 | 4.85 | 4.89 | 4.90 | 4.86 | **4.87** |
| Tutor's ability to make work understandable | 4.87 | 4.88 | 4.89 | 4.95 | 4.89 | **4.89** |
| Tutor's knowledge of the material | 4.86 | 4.86 | 4.95 | 4.96 | 4.88 | **4.90** |
| Tutor's attitude | 4.90 | 4.93 | 4.94 | 4.98 | 4.93 | **4.93** |
| Tutor's communication skills | 4.79 | 4.89 | 4.92 | 4.93 | 4.89 | **4.88** |
| Overall rating of the session | 4.90 | 4.90 | 4.95 | 4.97 | 4.97 | **4.92** |

*Note: Survey responses were provided on a scale from (1) = Unacceptable to (5) = Excellent*

Figure 11. Cumulative Mean ACE Module Satisfaction Ratings (*n* = 1408)



Mean Level of Satisfaction
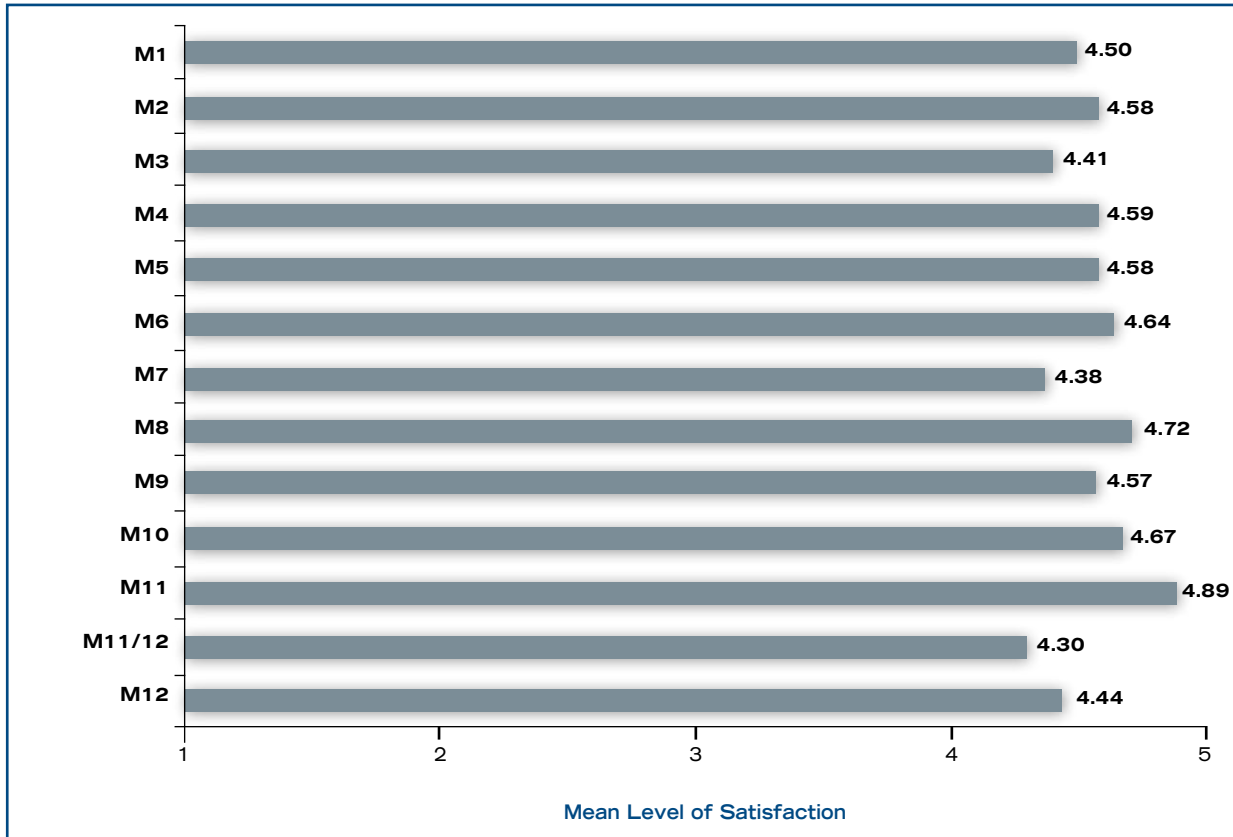
*Scale: (1) Very Dissatisfied to (5) Very Satisfied*

Table 3. Cumulative Supervisor Satisfaction with Service Learning Interns

| | Year Three (N = 23) | Year Four (N = 16) | Year Five (N = 13) | Cumulative |
|---|---|---|---|---|
| Fulfillment of Internship Outcomes | 4.83 | 4.94 | 4.77 | 4.85 |
| Professional Conduct | 4.83 | 4.88 | 4.92 | 4.87 |
| Attendance and Punctuality | 4.83 | 4.88 | 4.85 | 4.85 |
| Quality of performance of service activities | 4.78 | 4.81 | 4.92 | 4.82 |
| Commitment to completing tasks | 4.87 | 4.94 | 4.92 | 4.90 |
| Adaptability to change | 4.87 | 4.81 | 4.85 | 4.85 |
| Respect for confidentiality | 4.89 | 4.94 | 5.00 | 4.93 |
| Understanding of organization's role in the community | 4.83 | 4.81 | 4.92 | 4.85 |
| Enthusiasm for service activities | 4.83 | 4.75 | 4.83 | 4.81 |
| Knowledge of core concepts | 4.76 | 4.81 | 4.85 | 4.80 |
| Benefit of service provided to agency | 4.94 | 4.81 | 4.83 | 4.87 |
| Interaction with *CoyoteCareers* Staff | 4.94 | 4.86 | 4.82 | 4.89 |
| Communication | 4.91 | 4.75 | 4.73 | 4.82 |
| Benefit to your organization | 4.95 | 4.81 | 4.75 | 4.86 |
| Overall experience with the *CoyoteCareers* program | 4.90 | 4.81 | 4.75 | 4.83 |

*Scale: (1) Very Dissatisfied to (5) Very Satisfied:*

Table 4. Cumulative Student Intern Satisfaction with Service Learning Experience

| | Year One (N = 14) | Year Two (N = 17) | Year Three (N = 26) | Year Four (N = 24) | Year Five (N = 23) | Cumulative |
|---|---|---|---|---|---|---|
| **Information presented in Internship workshop** | 4.38 | 4.71 | 4.71 | 4.58 | 4.44 | **4.58** |
| **Orientation training by internship staff** | 4.50 | 4.74 | 4.65 | 4.91 | 4.61 | **4.70** |
| **Orientation and training by *CoyoteCareers*** | 4.31 | 4.73 | 4.84 | 4.58 | 4.55 | **4.63** |
| **Site Supervision** | 4.31 | 4.79 | 4.69 | 4.46 | 4.57 | **4.58** |
| **Relevance of internship's tasks to future career** | 4.31 | 4.74 | 4.58 | 4.54 | 4.32 | **4.50** |
| **Your role in the internship experience** | 4.31 | 4.79 | 4.62 | 4.75 | 4.26 | **4.57** |

*Scale: (1) Very Dissatisfied to (5) Very Satisfied:*

Data also suggest that the *CoyoteCareers* program was able to build successful and reciprocally beneficial community partnerships with service learning sites. Site supervisors reported that they were very satisfied with their interactions with program staff and felt that the service learning program benefited their organization (see **Table 3**). Overall, they were also very satisfied with their student interns finding them to be professional and committed to completing tasks. Additionally, students were highly satisfied with their internship experience and felt that the tasks they completed at their internship were highly relevant to their future career (see **Table 4**).

The cumulative data on program participants' satisfaction allows us to answer the second part of the first evaluation question, that is, services appear to have enhanced program participants' academic experiences, knowledge, and career and educational opportunities.

The fact that the *CoyoteCareers* program has been publicly recognized, awarded, and modeled by other educational institutions provides additional support to the claim that *CoyoteCareers* has successfully expanded and enhanced academic and student support services (see **Appendix B** for a description of *CoyoteCareers* presentations, recognition, and awards).

## Key Findings: Academic and Student Support Services

Overall, program activities and services have expanded and enhanced academic support offerings, career preparation, program quality, internship availability in SMART fields, and involvement of alumni at CSUSB. *CoyoteCareers* has either met or surpassed all of its program goals indicating that program activities have expanded academic and career support services for program-eligible students and the CSUSB community in general. *CoyoteCareers* activities also enhanced students' career and educational experiences and opportunities as indicated by students' high level of satisfaction with program components.

## Key Findings

| Evaluation Question | Key Findings |
|---|---|
| **Q1)** Do the activities in the *CoyoteCareers* program expand and enhance academic support offerings, career preparation, program quality, internship availability in SMART fields, and involvement of alumni at CSUSB? | Data, from a variety of sources including summaries of program goals and participant satisfaction, indicate that *CoyoteCareers* has been able to successfully expand their program activities over the 5-year grant period and enhance program participants' academic experiences, knowledge, and educational opportunities |

# Student Academic Achievement

**Q2)** Do the activities in the *CoyoteCareers* program expand educational opportunities for and improve the academic achievement of Hispanic and low-income students in the SMART fields?

The *CoyoteCareers* program provided support services to Hispanic and low-income students in the SMART fields anticipating that these services would improve the targeted populations' academic achievement. Although all of the *CoyoteCareers* program activities are thought to positively influence students' academic outcomes, tutoring was the only program component thought to *directly* impact students' academic achievement. Academic achievement was assessed by tracking program participants' grades in the classes in which they received tutoring.

received tutoring ($M = 2.49$, $SE = .04$) than program-eligible students who did not attend tutoring ($M = 2.15$, $SE = .02$). This difference was statistically significant $t(4399) = -7.10$, $p < .001$. Although this finding suggests that tutoring may have helped improve students' academic performance, it is also possible that those students who went to tutoring were more motivated to achieve than those students who did not go to tutoring.

A correlational analysis was conducted to determine whether the amount of tutoring program-eligible students received (i.e., tutoring dosage) was at all related to their grade performance in the class in which they received tutoring. Results show that the amount of tutoring dosage was not significantly related to grade performance ($r = -.020$, $p = .57$). In other words, regardless of whether

**Tutoring** → **Improves Grades** → **Increases Retention & Graduation Rates**
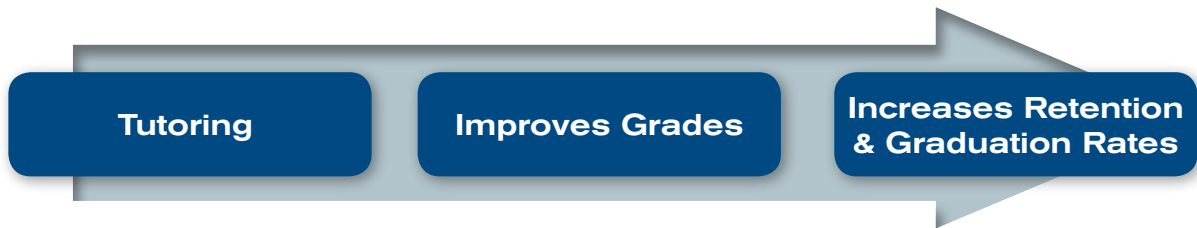
To answer the second evaluation question, do the activities in the program expand educational opportunities for and improve the acadmic achievement of its targeted population, previously collected tutoring data was analyzed. Specifically, Cobblestone compared the grades of program-eligible (i.e., Hispanic and/or low-income students in the SMART fields) students who attended tutoring (either in the Learning Center or within department) with the grades of program-eligible students who did not attend tutoring. The grades compared were those grades received in the classes in which they received (did not receive) tutoring. The effect of tutoring dosage (i.e., the amount of tutoring) on program-eligible students' grades was also assessed.

Tutoring data was collected throughout the entire 5-year grant period. Specifically, data was collected on the number of unique students that attended tutoring, the number of hours that they attended tutoring, and their grade in the class in which they received tutoring. An independent samples t-test was conducted to determine whether the grades of program-eligible students who attended tutoring were significantly different than the grades of program-eligible students who did not attend tutoring (see **Figure 12**).

On average program-eligible students who attended tutoring had higher grades in the classes in which they

students attended tutoring every day or just a few times throughout the quarter did not at all affect their grade in the class in which they received tutoring. Data from interviews with Learning Center tutors provide one plausible explanation for this finding. Tutors indicated that tutoring attendance is usually low in the beginning of the academic quarter; it is not until students take their midterm and do poorly or receive a failing grade that tutoring attendance drastically increases. Unfortunately,

### Figure 12. Program-Eligible Students Mean Grades in STEM Classes



Received Tutoring ($n = 782$) — 2.49

Did Not Receive Tutoring ($n = 3619$) — 2.15
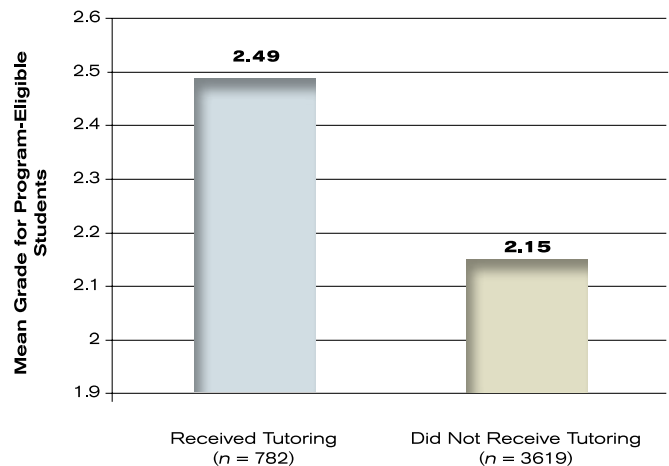
even though many of these students attend tutoring sessions and try to improve their grade they are unable to do so because it is too late in the quarter.

In summary, the t-test and the correlational analysis suggest that program-eligible students who attended tutoring had better grade performance than program-eligible students who did not attend; however, the amount of tutoring they received did not affect their grade.

In a separate report (Matelski, 2012), further analyses were conducted to a) help *CoyoteCareers* understand how and why tutoring leads (does not lead) to its intended outcomes, b) contribute to general knowledge about tutoring, and c) further help to inform the development of other tutoring programs by identifying the mechanisms that underlie tutor-seeking behaviors (see **Appendix C**). Overall, findings suggest that tutoring may lead to positive academic outcomes because it teaches students the skills needed to succeed in STEM. Specifically, tutors, exemplars of student success, help students learn to teach themselves, foster students' self-efficacy, which in turn likely increases students' identification with STEM and commitment to the field.

## Key Findings: Student Academic Achievement

*CoyoteCareers* has expanded educational opportunities for and improved the academic achievement of program-eligible students in the SMART fields. Tutoring is the main program component thought to positively impact students' academic performance. It was found that tutoring improved the grade performance of program-eligible students. That is, program-eligible students who used tutoring services received higher scores in the classes in which they received tutoring than program-eligible students who did not attend tutoring. Interestingly tutoring dosage (i.e., the amount of tutoring received) was not related to grade performance. Tutor interview data suggest that the reason for this finding is that students who usually use tutoring the most are those who are at high risk of failing their class.

## Key Findings

| Evaluation Question | Key Findings |
|---|---|
| **Q2)** Do the activities in the *CoyoteCareers* program expand educational opportunities for and improve the academic achievement of Hispanic and low-income students in the SMART fields? | Tutoring, one main components of the *CoyoteCareers* program, improved the academic achievement (i.e., grade performance) of program-eligible students. That is, program-eligible students who attended tutoring received higher course grades in the classes in which they received tutoring than program eligible students who did not attend tutoring. |

# Student Retention and Graduation

> **Q3)** Do the activities in the *CoyoteCareers* program help Hispanic and low-income students complete postsecondary degrees in the SMART disciplines?

The ultimate goal of the *CoyoteCareers* program was to increase persistence, retention, and graduation rates for Hispanic and/or low-income students in the SMART fields. To answer the third and final evaluation question, do the activities in the program help Hispanic and low-income students complete degrees in SMART disciplines, previously collected program data was analyzed. First, Cobblestone analyzed students' graduation and retention rates over the 5-year program period to assess whether students' participation in *CoyoteCareers* (i.e., students' participation in any aspect of the program overall) affected their ability to persist and complete a postsecondary degree. Second, we assessed whether 6-year graduation rates for first-time freshmen (All first-time freshmen and first-time freshmen in the College of Natural Sciences ) increased with the induction of the *CoyoteCareers* program. Third, Cobblestone assessed whether participation in specific program activities predicted persistence and completion of a secondary degree.

Retention rate was defined as the percentage of students who enroll at CSUSB and remain enrolled their following year. Retention rates were calculated for various cohorts of students. A cohort consists of all the students that matriculated during a given academic year. For example, the 2007 cohort consists of all students that matriculated in the 2007 academic year including students that began in the fall 2007, winter 2008, and spring 2008 academic quarters. Retention rates for the 2007 cohort were calculated by determining the percentage of students enrolled at CSUSB in fall 2007, winter 2008, and spring 2008 that remained enrolled exactly one year later from their start date (i.e. fall 2008, winter, 2009, and spring 2009), and subsequent years were also compared. Graduation was defined as completion of an undergraduate degree at CSUSB.

Retention analyses were focused primarily on students who entered CSUSB as first-time full-time freshman; retention and graduation analyses were explored only for those students who matriculated as transfer students. Retention and graduation analyses for transfer students were conducted separately for lower-unit transfer students (i.e., students who transferred to CSUSB as freshmen or sophomores) and higher-unit transfer students (i.e., students who transferred to CSUSB as juniors or seniors), as the number of units at the time of transfer was predicted to likely impact graduation rates.

In the first analysis, attention was given specifically to first year retention (i.e., percentage of students enrolled at CSUSB in their second year), through fourth year retention (i.e., percentage of students enrolled at CSUSB in their fifth year). Given that the *CoyoteCareers* program began in 2007, retention rates were calculated for four cohorts of students (2007, 2008, 2009, 2010). Retention rates for first-time full-time freshmen, lower-unit transfer students, and higher-unit transfer students were compared separately. Additionally, graduation rates were conducted for lower-unit and higher-unit transfer students. Analyses differentiated between *CoyoteCareers* students and *CoyoteCareers*-eligible students. *CoyoteCareers* students were defined as students that participated in any *CoyoteCareers* activity (i.e. internship, ACE module, or tutoring) regardless of whether they were eligible to participate in the *CoyoteCareers* program. On the other hand, *CoyoteCareers*-eligible students were students eligible for the *CoyoteCareers* program; in other words, they were in a SMART field and were identified as either low-income or Hispanic.

## Retention for First-Time Freshmen

Among first-time full-time freshmen, across all years, *CoyoteCareers* freshmen (those freshmen that participated in program activities regardless of program eligibility) have considerably higher first-, second-, third- and fourth-year retention rate compared to *all* freshmen in SMART majors at CSUSB (see **Table 5**). Findings suggest that regardless of program eligibility (major, SES, ethnicity), those who participated in any aspect of the *CoyoteCareers* program were more likely to continue at CSUSB in future years.

Additionally, retention rates for *CoyoteCareers*-eligible freshmen (freshmen that are program eligible—Hispanic and/or low income in a SMART major) were calculated. Analyses specifically looked at retention rates for *CoyoteCareers*-eligible freshmen that participated in

---

[1] Six-year graduation rates only include students in the STEM fields (i.e., students in the College of Natural Sciences) and do not include *CoyoteCareers* students in majors outside of the College of Natural Sciences (e.g., Arabic). Similarly these calculations do include students from science majors that are not supported by *CoyoteCareers* (i.e., Health Sciences, Kinesiology, Nursing, Nutrition and Food Sciences). This analysis was conducted to determine the general impact of *CoyoteCareers* on students in the SMART fields and on CSUSB in general.

Table 5. Retention Rates for First-Time *CoyoteCareers* Freshman Regardless of Program Eligibility

| Cohort | N | | 1 year Retention | | 2 year Retention | | 3 year Retention | | 4 year Retention | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All CSUSB | *Coyote Careers* | All CSUSB | *Coyote Careers* | All CSUSB | *Coyote Careers* | All CSUSB | *Coyote Careers* | All CSUSB | *Coyote Careers* |
| **2007** | 1821 | 179 | 76% (1383) | 97% (174) | 62% (1129) | 94% (168) | 54% (976) | 89% (160) | 41% (745) | 72% (129) |
| **2008** | 2079 | 220 | 82% (1696) | 96% (212) | 67% (1391) | 90% (199) | 61% (1260) | 83% (182) | - | - |
| **2009** | 2060 | 276 | 85% (1751) | 96% (265) | 73% (1507) | 92% (254) | - | - | - | - |
| **2010** | 1912 | 203 | 88% (1688) | 97% (197) | - | - | - | - | - | - |
| **AVG.** | | | **83%** | **97%** | **68%** | **92%** | **57%** | **86%** | **41%** | **72%** |

program activities (internship, ACE Module, tutoring) versus those that did not participate. Among first-time full-time freshmen, across all years, *CoyoteCareers*-eligible freshmen that participated in a program activity have considerably higher first-, second-, third-, and fourth-year retention rate compared to *CoyoteCareers*-eligible freshmen that did not participate in a program activity (see **Table 6**).

Overall, these findings suggest that the *CoyoteCareers* program positively influenced first-time full-time freshmen retention rates, particularly for target students who were in a SMART field and identified as Hispanic and/or low income. All freshmen students, regardless of program eligibility, benefitted from *CoyoteCareers* program participation. These results indicate that *CoyoteCareers* program activities such as tutoring, ACE modules and internships produced the intended effect of supporting students academically such that they continued to be enrolled at CSUSB. In this way, the *CoyoteCareers* program has been successful in achieving a primary program goal regarding student retention for those more traditional students that entered CSUSB as first-time, full-time freshman. The next analyses focused on transfer students.

Table 6. Retention Rates for Eligible *CoyoteCareers* First-Time Freshmen

| Cohort | | N | 1 year Retention | 2 year Retention | 3 year Retention | 4 year Retention |
|---|---|---|---|---|---|---|
| **2007** | Participants | 71 | 99% (70) | 92% (65) | 90% (64) | 79% 56) |
| | Non-participants | 188 | 73% (138) | 56% (106) | 45% (85) | 35% (66) |
| **2008** | Participants | 103 | 97% (100) | 92% (95) | 86% (89) | - |
| | Non-participants | 267 | 81% (217) | 67% (179) | 61% (164) | - |
| **2009** | Participants | 124 | 98% (122) | 95% (118) | - | - |
| | Non-participants | 266 | 84% (223) | 70% (187) | - | - |
| **2010** | Participants | 96 | 100% (96) | - | - | - |
| | Non-participants | 249 | 90% (223) | - | - | - |
| **AVG.** | Participants | | **99%** | **93%** | **88%** | **79%** |
| | Non-participant | | **82%** | **65%** | **55%** | **35%** |

## Retention and Graduation Rates for Lower-Unit and Higher-Unit Transfer Students

Retention and graduation rates were conducted separately for lower-unit and higher-unit transfer students. Among all transfer students (both lower- and higher-unit), across all cohorts, *CoyoteCareers* transfer students (transfer students that participated in a program activity regardless of program eligibility) had higher first-, second-, third-, and fourth-year retention and graduation rates compared to all CSUSB transfer students in SMART majors. **Appendix D** includes summaries of graduation and retention rates for *CoyoteCareers* transfer students; **Appendix E** shows the comparison of all CSUSB transfer students. Additionally, **Table 7** shows the cumulative retention and graduation rates for all *CoyoteCareers* and CSUSB transfer students (both higher- and lower-unit). Results indicate that all transfer students, regardless of unit level and program eligibility, benefitted from participating in *CoyoteCareers* activities.

the entire university, the percentage of first-time freshmen enrolled at CSUSB who graduated within six years of enrollment was tracked. This rate was tracked for *all* CSUSB first-time full-time freshmen (see **Table 8**) and first-time full-time freshmen in the STEM fields (i.e., freshmen enrolled in the College of Natural Sciences; see **Table 9**). The graduation rates for all first-time freshmen remained stable throughout the programs' duration. However, as **Table 9** illustrates, the 6-year graduation rates for first-time freshmen in the STEM fields increased slightly from baseline (i.e., the graduation rate for the 2000 cohort) through the end of the program. This finding suggests that first-time freshmen in STEM fields who were enrolled at CSUSB prior to the start of the program benefitted from the *CoyoteCareers* program, that is, their graduation rates increased. It is important to note that other CSUSB programs and initiatives also likely had an impact on student graduation rates.

Overall, the *CoyoteCareers* program appears to positively influence retention rates among first-time freshmen and

### Table 7. Cumulative Retention and Graduation Rates for *CoyoteCareers* and CSUSB Transfer Students

| | One Year Retention & Graduation Rates (all cohorts) | Two Year Retention & Graduation Rates (2007, 2008, & 2009 cohort) | Three Year Retention & Graduation Rates (2007 & 2008 cohort) | Four Year Retention & Graduation Rates (2007 cohort) |
|---|---|---|---|---|
| Lower-Unit *CoyoteCareers* | 96% | 91% | 89% | 80% |
| Lower-Unit All CSUSB | 81% | 71% | 63% | 59% |
| Higher-Unit *CoyoteCareers* | 97% | 91% | 89% | 88% |
| Higher-Unit All CSUSB | 85% | 78% | 73% | 70% |

Retention and graduation rates were also calculated for *CoyoteCareers*-eligible transfer students (lower-unit and higher-unit). The analysis specifically looked at retention and graduation rates for *CoyoteCareers*-eligible transfer students that participated in program activities versus those that did not participate. Among transfer students (lower-unit and higher-unit) across all years, *CoyoteCareers*-eligible (lower-unit and higher-unit) transfer students that participated in a *CoyoteCareers* activities have considerably higher first-, second-, third-, and fourth-year retention and graduation rates compared to *CoyoteCareers*-eligible (lower-unit and higher-unit) transfer students that did not participate in any program activities (see **Appendix F**). Consistent with previous findings, results suggest that participating in *CoyoteCareers* activities positively impacts graduation and retention rates.

To assess whether the *CoyoteCareers* program had an overall impact on first-time freshmen graduation rates for

retention and graduation rates of participating transfer students (lower-unit and higher-unit). Although students involved in the *CoyoteCareers* program had higher retention rates than all CSUSB students, these results should be interpreted with caution.

First, it is noteworthy to address the issue that CSUSB students voluntarily participate in any aspect of the

### Table 8. Six-Year Graduation Rates for All CSUSB First-Time Freshman

| Cohort | 6-Year Graduation Rates |
|---|---|
| 2000 | 42% |
| 2001 | 37% |
| 2002 | 41% |
| 2003 | 44% |
| 2004 | 42% |
| 2005 | 43% |

Table 9. Six-Year Graduation Rates for First-Time Freshman in the College of Natural Sciences

| Cohort | 6-Year Graduation Rates |
|---|---|
| 2000 | 42% |
| 2001 | 37% |
| 2002 | 41% |
| 2003 | 44% |
| 2004 | 42% |
| 2005 | 43% |

*CoyoteCareers* program. That is, when considering these analyses, there are fewer causal inferences that should be made than if students did not self-select into the program. For example, it is possible that *CoyoteCareers* students are driven to continue their education; therefore, they decide to participate in *CoyoteCareers* through tutoring services, instruction in ACE modules, or service-learning internships. Those students who engage in voluntary program offerings may, on average, be more motivated to do so than non-participating students and therefore higher retention and graduation rates may be a function of their personal motivation and drive not just due to participation in the *CoyoteCareers* program.

Second, it is also important to note that the number of students involved in *CoyoteCareers* is much smaller than the comparison group (all CSUSB students). Percentages are less stable when using small numbers and should be interpreted with care (e.g., 10% of 1,500 students dropping out of college is different from 10% of 50 students dropping out). However, these factors do not suggest that the program does not impact students positively. Perhaps, those driven students that participate in the program understand their need for supplemental assistance and would have otherwise not continued in or graduated from

college without the opportunities offered by *CoyoteCareers*. Regardless, it is clear that participation in the *CoyoteCareers* program and retention and graduation at CSUSB are linked.

Analyses were also conducted to assess whether participation in specific program activities predicted retention and/or graduation. A binary logistic regression was conducted to assess the impact of specific program activities (i.e., internship, ACE, tutoring) on the likelihood that program-eligible students were retained and/or graduated. Retention and graduation were combined into one binary outcome variable, persistence toward a degree. That is, students persisted towards a degree if they were either retained or graduated. The full model containing all three predictors (i.e., internship, ACE, tutoring) was statistically significant, $\chi^2$ (3) = 107.60, p < .001. ACE participation and tutoring participation were the only variables that made a significant contribution to the model (i.e., uniquely predicted persistence; see **Table 10**). Program-eligible students who participated/used these services were more likely to persist than program-eligible students who did not participate/use program services. Tutoring was the strongest predictor of persistence toward a degree, recording an odds ratio of 2.80. This indicates that the odds of a student persisting towards a degree are 2.80 times more likely if they used tutoring than if they did not use tutoring.

Although analyses indicate that program-eligible students who participated in an internship were no more likely to persist than program-eligible students who did not participate in an internship, findings from an intern follow-up survey suggest that many students who completed internships graduated and either attended graduate/professional school or entered into a career in their field of study. Former service learning interns were contacted

Table 10. Logistics Regression Summary Predicting Student Persistence (*n* = 2894)

| Predictor | B | SE B | 95% CI for Odds Ratio | | |
|---|---|---|---|---|---|
| | | | Lower | Odds Ratio | Upper |
| Constant | .98 | .05 | | | |
| Internship Participation | .22 | .34 | .64 | 1.25 | 2.41 |
| ACE Participation | 1.01*** | .20 | 1.85 | 2.75 | 4.10 |
| Tutoring Participation | 1.03**** | .15 | 2.07 | 2.80 | 3.78 |

*Model $\chi^2$ (3) = 107.60, p < .001. *p < .05, **p < .01, ***p <.001*

via Facebook and LinkedIn to provide information on their current academic and professional status. Although many former service learning interns were unreachable, 54 out of 120 responded to the survey. A total of 24 out of 54 reported that they were enrolled in graduate, medical and/or professional school and the rest of the former service learning interns reported employment in their field of study. Although causal claims cannot be made, these findings, along with previously discussed student intern satisfaction data, indicate that students gained valuable experience in their internships which likely gave their academic and career endeavors a competitive edge.

### Key Findings: Student Retention and Graduation

Overall, the activities in the *CoyoteCareers* program helped students persist toward and complete postsecondary degrees. While causal links are limited given the self-selected nature of the *CoyoteCareers* program, analyses of student retention at CSUSB indicate a high likelihood of staying in school for students who took advantage of program components in comparison to those students who did not, this includes both program-eligible and non program-eligible students. Similar to retention analyses, *CoyoteCareers* students and those taking advantage of program services had higher graduation rates in

***Sample of Former Service Learning Interns Post Graduation Placements\****

Harvard Medical School
USDA Natural Resource Conservation Service
Keck Graduate Institute of Biosciences
UCLA Medical School
Federal Reserve Bank of New York
UC Davis Veterinary School
Children's Hospital Los Angeles
*not a complete list

comparison to those students who did not take advantage of program services. It is clear that participation in the *CoyoteCareers* program is linked with academic gains for participating students, although causal inferences are also limited. Additional analyses suggest that both tutoring and ACE participation significantly predict persistence toward a degree. Participation in an internship did not significantly predict persistence likely do to the fact that there was such a small number of students who participated in internships compared to the overall sample size. However, survey data indicate that many former student interns do indeed graduate and attend graduate and/or professional school. Many interns were also offered employment in their field of study.

| Evaluation Question | Key Findings |
|---|---|
| **Q3)** Do the activities in the *CoyoteCareers* program help Hispanic and low-income students complete postsecondary degrees in the SMART disciplines? | Students who participated in the *CoyoteCareers* program were more likely to persist toward a degree and graduate than students who did not participate. Statistical analysis suggests that tutoring and ACE participation significantly predicted persistance toward a degree. Many former student interns also reported attending graduate school and employment in their field of study. |

# Conclusions

This report has examined the overall impact of the *CoyoteCareers* program. The programs' progress towards its goals was tracked, and various data sources and analyses were used to answer key evaluation questions. *CoyoteCareers* met or exceeded all of its benchmarks thus indicating that program activities have expanded throughout the duration of the grant. Students' reported high level of satisfaction with program activities suggests that tutoring, ACE module workshops, and internships helped to enhance students' academic experiences. Although *CoyoteCareers* aimed to expand support services and enhance students' experiences, the programs' main goal was to improve Hispanic and low-income students' academic achievement and help this population complete postsecondary degrees. Indeed program-eligible students who participated in tutoring had better grade performance than program-eligible students who did not attend tutoring. Additionally, program activities were found to help all participating students persist toward their degree. Originally designed to support low-income and Hispanic students in SMART disciplines at CSUSB, *CoyoteCareers* has grown to have a positive impact on many student organizations, departments, alumni, and community organizations in addition to students directly served by the program. Without question, the *CoyoteCareers* program has provided students with valuable experiences to enhance academic and job preparation skills and opportunities. *CoyoteCareers* should continue to serve as a model program for other CSU campuses as well as other Hispanic Serving Institutions throughout the United States.

# References

Borders-Edgar, P., Arredondo, P., Kurpis, S. R., & Rund, J. (2011). A longitudinal analysis of Latina/o students' academic persistence. *Journal of Hispanic Higher Education, 10*, 358-368.

Chapa, J., & De La Rosa, B. (2006). The problematic pipeline: Demographic trends and Latino participation in graduate Science, Technology, Engineering, and Mathematics programs, *Journal of Hispanic Higher Education, 5*, 203-221.

Fischer, M. J. (2010). A longitudinal examination of the role of stereotype threat and racial climate on college outcomes for minorities at elite institutions. *Social Psychology Education, 13*, 19-40.

Kezar, A. & Rhoads, R.A. (2001). The dynamic tensions of service learning in higher education: A philosophical perspective. *The Journal of Higher Education, 72(2)*, 148-171.

Matelski, M. (2012). Evaluation of the tutoring component of *CoyoteCareers*, 1 – 35.

National Science Foundation. (2005). Women, minorities, and persons with disabilities in science and engineering. Retrieved August 24, 2005, from http://www.nsf.gov/statistics/wmpd/start.htm

Pascarella, E.T, Pierson, C. T., Wolniak, G.C, & Terenzini, P.C. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *The Journal of Higher Education, 75(3)*, 249-284.

# Appendix A. SMART Field Majors at CSUSB

- Arabic
- Bioinfomatics
- Biology
- Chemistry
- Computer Engineering
- Computer Science
- Geography
- Geology
- Information Security Management
- Mathematics
- Physics

# Appendix B. *CoyoteCareers* Presentations, Recognition and Awards

**The success of the *CoyoteCareers* program has resulted in a variety of positive activities and multiple awards through Year 5. The following describes numerous developments in the dissemination of the *CoyoteCareers* model beyond CSUSB.**

• Through the *Service-Learning Transforming Educational Models in Science, Technology, Engineering and Mathematics (STEM)$^2$* program facilitated by the CSU Chancellor's Office and funded by Learn and Serve America: Corporation for National and Community Service, the *CoyoteCareers* program served as a model in STEM education for all CSU campuses. In Year 5, the manual was distributed and two presentations were provided for nearly all CSU campuses to learn about the *CoyoteCareers* program and to incorporate program elements throughout the CSU. For more information see: http://www.calstate.edu/cce/stem/learnandserve/products.shtml#student

• The *CoyoteCareers* leadership team has presented at national, regional, state and system-wide conferences, as well as system-wide meetings including CSU's Alumni Council and presentations to CSU Foundation board members. These meetings facilitated the dissemination of best practices in serving undergraduate STEM students through the *CoyoteCareers* program. Presentations included the following:
  – Title V Project Director's Conference (March, 2010). Poster presentation. Washington, D.C.
  – Southwest Regional Title V Best Practices Conference (March, 2011). *Career and community connections for STEM student success.* La Verne, CA.
  – Association of American Colleges and Universities (March, 2011). *Career and community connections for STEM student success.* Miami, FL.
  – Continuums of Service Conference (April, 2011). *Expanding the STEM pipeline: A collaborative effort for success.* San Diego, CA.
  – Title V/HSI Best Practices Conference (March, 2010). *New partnerships for a new economy: Making the case for service learning internship programs.* San Antonio, TX.

• The *CoyoteCareers* program has also been recognized by various organizations in recognition of their outstanding program. Awards include the **National Association of Colleges and Employers Innovation Excellence** (NACE) Award for Diversity and the 2011 **CASE District VII Bronze Award of Excellence for Alumni Relations – Collaborative Programs**.

• Diane Podolske, Project Director of *CoyoteCareers,* was a recipient of the **Augie Award**, one of the most coveted prized offered by the university. The Augie is awarded to a CSUSB faculty or staff member who "best emulates a caring spirit, unquenchable enthusiasm for assisting others, and warmth in thoughtfully reaching out to friends and strangers alike".

• The *CoyoteCareers* team was recognized for their efforts on *CoyoteCareers* with the **President's Team Achievement Award**, and several members also received a Team Award for the **DisAbility Sports Festival** and the **President's Gala** in 2012.

• The *CoyoteCareers* team, along with the Director of the *(STEM)$^2$* Initiative was nominated by the CSU Chancellor Charles Reed for the **James Irvine Foundation Leadership Award**.
  In addition to these presentations and awards, the *CoyoteCareers* program has produced a video that is publically available at: http://www.youtube.com/watch?v=oeBEUPBHKz0 to continue dissemination of its programs to others interested in promoting student success.

# Appendix C. In-Depth Tutoring Analysis

One of *CoyoteCareers* main goals was to expand academic assistance resources (i.e. tutoring services) to help Hispanic and low-income students complete SMART field curricula. To achieve this goal, the program provided additional peer tutoring in gatekeeper courses and took steps to ensure that all low-income and Hispanic students took advantage of this assistance. With regard to tutoring, Cobblestone assessed outputs, that is, whether there was an increase in peer tutor usage for SMART courses with low pass rates. Although data on tutoring service usage is informative, it does not explain how, why, or for whom program activities (i.e., tutoring) lead to intended outcomes (i.e., helping students complete SMART field curricula).

There are a number of implicit assumptions about the causal processes that underlie the link between tutoring and its intended academic outcomes including: if tutoring services are provided then students in need of assistance will take advantage of these services, and if students attend tutoring they will be able to complete gatekeeper courses in the SMART field curricula and advance towards their degree. We used psychological theories and research to assess the validity of assumptions about the causal processes that underlie this specific program theory. Social psychological research on stigma (i.e., help-seeking stigma) was used to help inform why students seek (do not seek) academic assistance (i.e. tutoring) and research on social support (i.e., mentor, role model), self-efficacy, and identification with STEM[2] was used to help explain why tutoring leads (does not lead) to academic achievement and increased retention and graduation rates.

## Research Questions

The tutoring analysis aimed to answer two main research questions:

The findings from the following in-depth tutoring analysis 1) provide our clients with a better understanding of how and why tutoring leads to academic achievement and increased retention and graduation in the SMART fields, 2) contribute to general knowledge about tutoring, and 3) further help to inform the development and modification of other tutoring programs by identifying the mechanisms that underlie tutor-seeking behaviors.

## Research Methods

The evaluation of the tutoring component of the *CoyoteCareers* program was conducted during Fall 2012 to examine why students chose to attend (not to attend) tutoring, and explain how or why tutoring may lead to its intended academic outcomes. These questions were answered using a mixed methods design that included the use of both quantitative and qualitative data. These data were gathered from a variety of sources including student surveys, tutor interviews and the Office of Institutional Research at CSUSB.

## Tutoring Attendance

One implicit assumption of the *CoyoteCareers* program is that if tutoring services are provided then students in need of assistance will take advantage of these services; however, this does not always occur. Tutoring usage as well as various reasons why students attend (not attend) tutoring were assessed in a student survey.

A total of 316 students responded to a number of survey questions about their awareness of tutoring services, perception of need, tutoring usage, and beliefs about help-seeking behavior. According to the survey results awareness of tutoring services was the strongest predictor of tutoring usage (approximately 71% of students were aware of tutoring

| Research Question 1 | Research Question 2 |
|---|---|
| Why do students choose to attend (not to attend) tutoring? | Does social support, self-beliefs, and identification with SMART help explain the relationship between tutoring and its intended outcomes? |

[2]The *CoyoteCareers* grant aimed to support students in the SMART fields. Retention and graduation rates were calculated for program-eligible students (i.e., Hispanic and/or low-income students in the SMART fields). However, due to logistical concern (e.g., time constraints), the survey assessing students awareness of and beliefs about tutoring was given to students in classrooms of professors in the College of Natural Sciences. Only the responses of students who self-identified as majoring in one the grant-supported majors were reported in this in-depth tutoring analysis.

services). Students not only needed to be aware of tutoring services they also needed to know "how to go about using services" in order to seek out tutoring assistance. Perception of need was another strong predictor of tutoring usage. Although approximately 50% of students felt they needed tutoring to pass their class and understand course content, only 37% actually used tutoring services. Barriers to tutoring attendance were assessed such as internalization of the help-seeking stigma, the self-threat of acknowledging one's need for help and the embarrassment of its public disclosure. Overall, students self-reported low levels of help-seeking stigma (and it was not a significant predictor of tutoring usage); however tutor interview data suggest that students experience some anxiety and discomfort when they first seek out tutoring assistance. In general men were less likely to attend tutoring than women ($\chi^2$ (1) = 7.51, p < .05). For those students who did not attend tutoring, men (M = 2.64, SD = 1.88) reported significantly higher levels of stigma than women (M = 1.99, SD = 1.28; t(196) = 2.88, p < .05). This finding is in line with previous findings from the literature, that men are more likely than women to experience the help-seeking stigma because of cultural stereotypes about masculinity. Other reasons students gave for not attending tutoring were time constraints and preference for other study/review formats.

## Tutoring Benefits

To help explain the relationship between tutoring and its positive student academic outcomes, students' self-efficacy, perceptions of social support, and identification with STEM were assessed. Students who attended tutoring reported high mean levels of self-efficacy and identification with STEM. Specifically students who went to tutoring felt that performing well in STEM was important to their self-image (M = 6.94; 1 = *strongly disagree* to 9 = *strongly*), and they also felt confident that they could understand basic (M = 6.63) and complex concepts (M = 6.11) in the courses in which they received tutoring. Data from tutor interviews complemented these findings. Tutors reported that they aimed to increase students' self-efficacy and students' ability to study, teach themselves and perform well on their own. Students' also reported that they viewed their tutor as a mentor/role model and tutors agreed with these findings. Causal claims cannot be made because of the nature of this study; however findings suggest that peer tutors, exemplars of student success, help students learn to teach themselves, foster students' sense of self-efficacy, which in turn likely increases students' identification with STEM and commitment to STEM.

## Recommendations and Conclusions

The findings from this analysis can be used to modify tutoring services at CSUSB and inform the development of future tutoring programs. We know that students need to be aware of services and need to know "how to go about using these services" to seek out tutoring assistance. This suggests that marketing efforts should elucidate the steps that students need to take to use tutoring services. Additionally, we know men are less likely to use services than women and stigma is one barrier for those men who do not use services. Thus, it would be beneficial for future marketing campaigns to frame tutoring in ways that do not activate stigma, that is, avoid framing tutoring as help-seeking or as needing assistance. One suggestion is to frame tutoring as a personal competition, a way to beat one's personal best. Tutors should also be made aware (perhaps in their training) that students sometimes feel embarrassed or nervous to come to tutoring for the first time and because of this they should make students feel as comfortable as possible without patronizing them. We also know that although students feel they need tutoring to pass their class they still do not take advantage of tutoring services. The main reasons students do not use tutoring according to survey findings are time constraints and preference for different study/review formats. Although the Learning Center likely has a tight budget it may be beneficial for them to expand the dates/times they offer tutoring or offer online tutoring. They also could offer different study formats, days where they have midterm study sessions, or study group tutoring sessions, etc.

Results indicate that tutoring does positively impact students' academic achievement and persistence. Causal claims cannot be made as to why tutoring has these positive effects; however our findings suggest that students who use tutoring experience see their tutor as a mentor/role model and report high levels of content knowledge, self-efficacy, and identification with STEM. These findings should be incorporated into tutor training. Tutors should emphasize the similarities between them and the students they assist. For example, it may be beneficial for tutors to emphasize to tutees "I was able to get through this class, so can you, and this is how…"

# Appendix D. Summaries of Graduation and Retention Rates for *CoyoteCareers* Transfer Students

CSUSB *CoyoteCareers*: CUMULATIVE EVALUATION REPORT

**Table 11. Retention and Graduation Rates for *CoyoteCareers* Lower-Unit Transfer Students**

| Cohort | N *Coyote Careers* | One Year | | Two Years | | | Three Years | | | Four Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Retained | Dropped Out | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated |
| 2007 | 55 | 98% (54) | 2% (1) | 87% (48) | 7% (4) | 5% (3) | 58% (32) | 15% (8) | 27% (15) | 24% (13) | 20% (11) | 56% (31) |
| 2008 | 53 | 96% (51) | 4% (2) | 89% (47) | 6% (3) | 6% (3) | 72% (38) | 8% (4) | 21% (11) | - | - | - |
| 2009 | 42 | 95% (40) | 5% (2) | 83% (35) | 14% (6) | 2% (1) | - | - | - | - | - | - |
| 2010 | 19 | 89% (17) | 11% (2) | - | - | - | - | - | - | - | - | - |
| AVG. | | 96% | 4% | 87% | 9% | 5% | 65% | 11% | 24% | 24% | 20% | 56% |

**Table 12. Retention and Graduation Rates for *CoyoteCareers* Higher-Unit Transfer Students**

| Cohort | N *Coyote Careers* | One Year | | | Two Years | | | Three Years | | | Four Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated |
| 2007 | 135 | 99% (134) | 1% (1) | 0% (0) | 78% (105) | 7% (10) | 15% (20) | 41% (55) | 11% (15) | 48% (65) | 19% (26) | 12% (16) | 69% (93) |
| 2008 | 176 | 99% (174) | 1% (2) | 0% (0) | 74% (131) | 6% (11) | 19% (34) | 35% (62) | 10% (18) | 55% (96) | - | - | - |
| 2009 | 118 | 93% (110) | 6% (7) | 1% (1) | 62% (73) | 14% (16) | 25% (29) | - | - | - | - | - | - |
| 2010 | 160 | 93% (148) | 6% (10) | 1% (2) | - | - | - | - | - | - | - | - | - |
| AVG. | | 96% | 3% | 1% | 72% | 9% | 19% | 38% | 11% | 52% | 19% | 12% | 69% |

# Appendix E. Summaries of Graduation and Retention Rates for All CSUSB Transfer Students

**Table 13. Retention and Graduation Rates for All CSUSB Lower-Unit Transfer Students**

| Cohort | N | One Year | | Two Years | | | Three Years | | | Four Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CSUSB | Retained | Dropped Out | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated |
| 2007 | 720 | 81% (582) | 19% (138) | 60% (433) | 65% (224) | 11% (76) | 35% (253) | 37% (265) | 28% (202) | 16% (113) | 41% (296) | 43% (311) |
| 2008 | 581 | 78% (455) | 22% (126) | 63% (366) | 31% (179) | 6% (36) | 36% (211) | 38% (218) | 26% (152) | - | - | - |
| 2009 | 342 | 87% (296) | 13% (46) | 65% (224) | 27% (91) | 8% (27) | - | - | - | - | - | - |
| 2010 | 389 | 78% (305) | 22% (84) | - | - | - | - | - | - | - | - | - |
| AVG. | | 81% | 19% | 62% | 29% | 8% | 36% | 37% | 27% | 16% | 41% | 43% |

**Table 14. Retention and Graduation Rates for All CSUSB Higher-Unit Transfer Students**

| Cohort | N | One Year | | | Two Years | | | Three Years | | | Four Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CSUSB | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated |
| 2007 | 2016 | 83% (1678) | 16% (328) | 0% (10) | 51% (1031) | 24% (479) | 25% (506) | 21% (424) | 28% (561) | 51% (1031) | 8% (162) | 30% (608) | 62% (1246) |
| 2008 | 2169 | 85% (1854) | 14% (296) | 1% (19) | 54% (1172) | 21% (450) | 25% (547) | 21% (448) | 25% (550) | 54% (1171) | - | - | - |
| 2009 | 1611 | 86% (1378) | 14% (225) | 0% (8) | 48% (779) | 22% (354) | 30% (478) | - | - | - | - | - | - |
| 2010 | 2469 | 85% (2104) | 14% (352) | 1% (13) | - | - | - | - | - | - | - | - | - |
| AVG. | | 85% | 15% | 1% | 51% | 22% | 26% | 21% | 27% | 53% | 8% | 30% | 62% |

# Appendix F. Summaries of Graduation and Retention for *CoyoteCareers*-Eligible Transfer Students

Table 15. Retention and Graduation Rates for *CoyoteCareers*-Eligible Lower-Unit Transfer Students

| Cohort | | $N$ | One Year | | Two Years | | | Three Years | | | Four Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Retained | Dropped Out | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated |
| 2007 | Participants | 21 | 100% (21) | 0% (0) | 90% (19) | 5% (1) | 5% (1) | 76% (16) | 14% (3) | 10% (2) | 38% (8) | 24% (5) | 38% (8) |
| | Non-participants | 49 | 78% (38) | 22% (11) | 65% (32) | 35% (17) | 0% (0) | 53% (26) | 39% (19) | 8% (4) | 20% (10) | 53% (26) | 27% (13) |
| 2008 | Participants | 24 | 96% (23) | 4% (1) | 92% (22) | 8% (2) | 0% (0) | 75% (18) | 8% (2) | 17% (4) | - | - | - |
| | Non-participants | 38 | 79% (30) | 21% (8) | 61% (22) | 37% (14) | 3% (1) | 42% (16) | 47% (18) | 11% (4) | - | - | - |
| 2009 | Participants | 18 | 94% (17) | 6% (1) | 94% (17) | 6% (1) | 0% (0) | - | - | - | - | - | - |
| | Non-participants | 20 | 85% (17) | 15% (3) | 65% (13) | 35% (7) | 0% (0) | - | - | - | - | - | - |
| 2010 | Participants | 3 | 100% (3) | 0% (0) | - | - | - | - | - | - | - | - | - |
| | Non-participants | 19 | 89% (17) | 11% (2) | - | - | - | - | - | - | - | - | - |
| AVG. | Participants | | 97% | 3% | 92% | 6% | 2% | 76% | 11% | 13% | 38% | 24% | 38% |
| | Non-participants | | 81% | 19% | 64% | 36% | 1% | 48% | 43% | 9% | 20% | 53% | 27% |

Table 16. Retention and Graduation Rates for *CoyoteCareers*-Eligible Higher-Unit Students

| Cohort | | N | One Year | | | Two Years | | | Three Years | | | Four Years | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated | Retained | Dropped Out | Graduated |
| **2007** | Participants | 60 | 100% (60) | 0% (0) | 0% (0) | 78% (47) | 8% (5) | 13% (8) | 50% (30) | 10% (6) | 40% (24) | 22% (13) | 12% (7) | 67% (40) |
| | Non-participants | 106 | 84% (89) | 16% (17) | 0% (0) | 59% (63) | 26% (28) | 14% (15) | 29% (31) | 31% (33) | 40% (42) | 16% (17) | 35% (37) | 49% (52) |
| **2008** | Participants | 68 | 100% (68) | 0% (0) | 0% (0) | 76% (52) | 10% (7) | 13% (9) | 44% (30) | 13% (9) | 43% (29) | - | - | - |
| | Non-participants | 117 | 89% (104) | 11% (13) | 0% (0) | 74% (86) | 17% (20) | 9% (11) | 38% (45) | 28% (33) | 33% (39) | - | - | - |
| **2009** | Participants | 47 | 98% (46) | 2% (1) | 0% (0) | 79% (37) | 9% (4) | 13% (6) | - | - | - | - | - | - |
| | Non-participants | 99 | 81% (80) | 19% (19) | 0% (0) | 52% (51) | 30% (30) | 18% (18) | - | - | - | - | - | - |
| **2010** | Participants | 65 | 92% (60) | 8% (5) | 0% (0) | - | - | - | - | - | - | - | - | - |
| | Non-participants | 126 | 79% (100) | 20% (25) | 1% (1) | - | - | - | - | - | - | - | - | - |
| **AVG.** | Participants | | **98%** | **3%** | **0%** | **78%** | **9%** | **13%** | **47%** | **12%** | **41%** | **22%** | **12%** | **67%** |
| | Non-participants | | **83%** | **17%** | **0%** | **62%** | **24%** | **14%** | **34%** | **30%** | **36%** | **16%** | **35%** | **49%** |